**BEFORE THE**
**FEDERAL COMMUNICATIONS COMMISSION**
**WASHINGTON, D.C. 20554**

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| In the Matter of | ) | |
| | ) | |
| Service Rules for the 698-746, 747-762 And 777-792 MHz Bands | ) | WT Docket No. 06-150 |
| | ) | |
| Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems | ) | CC Docket No. 94-102 |
| | ) | |
| Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones | ) | WT Docket No. 01-309 |
| | ) | |
| Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services | ) | WT Docket No. 03-264 |
| | ) | |
| Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules | ) | WT Docket No. 06-169 |
| | ) | |
| Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band | ) | PS Docket No. 06-229 |
| | ) | |
| Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010 | ) | WT Docket No. 96-86 |

**COMMENTS OF THE MISSOURI STATE HIGHWAY PATROL (MSHP) ON THE REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING.**

## Introduction

## Missouri State Highway Patrol

The Missouri State Highway Patrol (MSHP) has been in existence since 1931 and the organization's Communications Division has been actively involved in providing a radio communications to its members since shortly after its inception. The MSHP retains some of the longest continuously held Commission authorizations in the Nation and have long been involved in regulatory and spectrum management issues that effect public safety communications both in Missouri and across the country. The MSHP has also been an active participant in the Association of Public Safety Communications Officials, Inc. (APCO) since that association's inception in St Louis, Missouri in 1935 and continues to be active in the organization today with regard to issues focusing on operational communications center standards, spectrum management and public safety frequency coordination activities. In addition, the MSHP has encouraged and advocated its personnel's involvement in the National Coordination Committee (NCC), as established by the Commission to identify the rules and implement the spectrum in a manner in which public safety envisioned its use of the 700 MHz band. MSHP communications personnel participated and chaired Working Groups of the NCC Interoperability Committee, so their reflection as to the intent of the Committee, its conclusions and its positions are first hand. Today, Patrol personnel continue to participate nationally in the Commission's regulatory processes regarding issues such as Re-farming/Narrow-banding below 512 MHz, 800 MHz re-banding, resulting Broadband over Power Line (BPL) deployment impact as well as today's current 700 MHz dialogue representing its agency as well as Missouri's public safety community. MSHP personnel initially convened the Region 24 700 MHz Regional Planning

Committee and MSHP personnel were substantial contributors to the development of the Region 24 700 MHz plan being the second plan approved by the Commission. We continue to work to make that band beneficial to the Missouri public safety user community. We thank the Commission for taking the bold steps necessary and asking the difficult questions regarding public safety communications requirements in the 700 MHz band for both today and tomorrow included in the Report and Order and the Further NPRM, and we look forward to a continued dialogue on these and other important issues.

The MSHP applauds the Commission for introducing this Further Notice of Proposed Rulemaking and continuing a much-needed dialogue addressing public safety's present and future communications needs. We agree that a new band plan and a new regulatory structure must be created for public safety to further its interoperable voice and data goals, develop broadband data capabilities to meet next-generation data applications while at the same time acknowledging future fiscal, political or spectral restrictions public safety will experience in meeting their communications needs. In this filing, we provide the Commission a perspective of users in the field and those with experience in regional spectrum management at the state and local level with a focus on supporting public safety users. The MSHP has long sponsored a local spectrum advisor in Missouri to assist the Association of Public Safety Communications Officials Inc. Automated Frequency Coordination (APCO-AFC) with frequency coordination and have consistently led Commission required regional planning efforts of public safety 700 and 800 MHz NPSPAC allocations in the Region 24 Regional Planning Committees. In addition, MSHP personnel participated in the National Coordination Committee (NCC) and

contributed as Chair of the Rules Policy and Spectrum Planning Working Group of its Interoperability Subcommittee while participating in other committees as well.

## Summary

We acknowledge that many of the conclusions identified by the public safety community in the NCC process subsequently require additional review since telecommunications breakthroughs in the last 5 years have radically changed the environment in which public safety seeks to meets its next generation capabilities. For instance, public safety can benefit from the breakthrough of new commercial wireless technologies that aggressively utilize a limited spectrum resource while also leveraging international commercial markets to provide the best product in the most cost effective manner. Public safety has already reaped benefits from similar Commission decisions in the 4940-4990 MHz proceeding, Docket 00-32, in which public safety successfully argued to the Commission the need to leverage existing, market-based 802.11a chipsets used worldwide in the 5 GHz band in its 4.9 GHz band implementation. The Commission realized that in order for public safety to benefit from and cost effectively utilize new technological advances in public safety spectrum, commercial capabilities and hardware have to be available for use within public safety spectrum. Today, public safety agencies benefit from the Commission's decision when utilizing 4940-4990 MHz.

We feel that the creation of a national licensee can enable public safety users to develop new partnerships and utilize existing infrastructure to improve the product they provide to those they serve. A national licensee can better globally manage the 700 MHz data allocation more

effectively than individual agencies over a wide area with the potential for more efficient implementation using shared assets at the local level being a byproduct of such oversight. The challenge for the National Licensee will be to be certain it allows for a mechanism to include all public safety voices in its decision making process. In our comments, we provide proposals to ensure that the National Licensee process for the implementation of broadband in the 700 MHz band is an inclusive one.

We feel that Commission Proposals 3 or 4, as outlined in the Further NPRM, offer public safety the band plan flexibility and protection to effectively utilize its spectrum internally and in spectrum sharing partnerships with existing commercial licensees, other regional public safety agencies and subsequent 700 MHz auction winners. In addition, we feel that existing broadband data technologies can offer public safety an increased degree of spectrum efficiency with network design's using aggressive channel re-use thereby maximizing capacity and spectrum usage within a community. Ironically, the DTV slow pace of the transition has provided the public safety community an extraordinary opportunity to revisit its initial band plan as developed by the National Coordination Committee (NCC) before substantial 700 MHz build-out has occurred and adjust its conclusions to leverage new technologies identified since 2001 and subsequent advancements in public safety applications with little difficulty and discomfort. We urge the Commission to adopt either Proposal 3 or Proposal 4 from the Commissions Further NPRM as they best prepare public safety and any subsequent national licensee for the next generation of public safety communications capabilities and applications.

The MSHP feels that public safety communications opportunities today are changing rapidly. With commercial wireless systems constantly adding resources and capacity to their networks each month, public safety could enter into a dialogue with a national licensee and commercial providers in their communities to identify where they have common needs and where new developments and spectrum sharing arrangements can improve capacity and service for both public safety and commercial interests within a community. In exchange for commercial users utilizing public safety spectrum on a secondary, preemptive basis in areas where excess public safety capacity exists, commercial auction winners and licensees should be made aware that a public safety agency's investments are the safety of the people served in each community and it is imperative that services developed for public safety use within a region serve all of the communities citizens, regardless of an areas demographics or population. From a public safety perspective, the MSHP understands the realities of the commercial wireless business and difficulties providing radio coverage in areas with sparse populations and low capacity and is willing to work with commercial wireless licensees to ensure that coverage needs are met in a cost effective manner. In return, we feel it is absolutely essential that public safety convey to the wireless community that its return on its investment is serving its constituents in need, without prejudice, regardless of location. This includes citizens in urban, suburban and rural areas of Missouri and the country and their needs must be met incrementally, over time, under a national strategic plan to ensure eventual nationwide broadband wireless coverage.

Finally, based on broad experience of supporting Missouri's diverse public safety community spectrum management needs, we document below the policies we propose and advocate for public safety in meeting its long-term broadband goals within reasonable time frames through

shifting sequences of system development. With new partners and building on the concepts originated in the Commission's Eighth and Ninth NPRM where the need was addressed for a national strategy to be implemented for public safety broadband capabilities, the MSHP feels that the future holds exciting capabilities for public safety. We believe the implementation of a cost effective public safety broadband solution at a national level that leverages commercial technologies should be the Commission's priority and that coverage requirements for such a system should be determined by public safety at the national and local level. In these comments, we consider the needs of Missouri and of the nation's public safety community, as it exists in today's urban, suburban and rural settings, each with their distinctive interoperable needs and requirements. With its urban and rural dualities, Missouri can be viewed as a microcosm of the nation and the problems that need to be addressed are only larger in scale. The systems envisioned for this user community must enable public safety as they work to reach broadband capabilities desired today, with applications that will become tomorrow's requirements. We also recognize the many conditions that agencies face when planning communication initiatives and those agencies, due to unique demographics, funding and topography, do not all evolve and accept new technological capabilities at the same rate. We feel the comments below will assist the Commission in arriving at guidelines that can realistically and more effectively meet public safety's goals as outlined in the NPRM. We again thank the Commission for issuing this Further NPRM and fostering this necessary discussion within the public safety community.

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**managed guard band. The Commission and public safety should ensure that the 5 MHz block between 763 and 768 MHz is retained for future 5 MHz technologies and that public safety is not precluded from technological opportunities, which utilize such bandwidths, in the future.**

**4. We concur with a National Licensee being allocated primary status on a nationwide license for the broadband spectrum block between 763-768 MHz to oversee the national broadband implementation strategy. The MSHP feels that the National Licensee should consist of national, state and local public safety users and representatives, including representatives of APCO, International Association of Chief's of Police (IACP), International Association of Fire Chiefs (IAFC), representatives of the Commission's designated regional planning committees (RPC'S) as well as other advocacy organizations such as National Association of Regional Planning Committees (NARPC), National Public Safety Telecommunications Council (NPSTC), National Association of State Chief Information Officers (NASCIO) and the National Governors Association (NGA). We also feel that the 1 MHz paired block between 768-769, which separates public safety's broadband and narrowband allocations, should be managed locally within regions by the appropriate regional planning committee with input from local licensees, respective adjacent region regional planning committees and the national licensee.**

**5. Wideband technologies should be permitted on a secondary basis utilized in a transitional manner during the implementation of the national broadband strategy. Secondary use of 700 MHz data implementations should be implemented at the pleasure of the national licensee and a regular dialogue between secondary users, regional planning committees and the national licensee will ensure a smooth transition from today's stovepipe, agency-based data systems to a national public safety broadband network. (See Appendix A)**

**6. We support the concept of a national network operator as outlined in the Frontline proposal that works with the national licensee in order to facilitate a public safety broadband strategy. We have questions as to how public safety is ensured of being able to promote its priorities in such an arrangement or arrangements with private companies, without being in the position to regulate those companies. We seek additional dialogue with the public safety community, the national licensee and other commercial wireless licensees to provide clarification as to how such an arrangement might work towards both the benefit of network operator(s) and public safety.**

## Comments

The MSHP is familiar with the history of this and related proceedings and issues rising from them and its personnel have filed comments with the Commission on multiple issues and also participated in the filing of comments by the Region 24 700 MHz Regional Planning Committee, outlining their position on what the future holds for Missouri public safety in its use of the 700 MHz public safety allocation. In commenting on this Further NPRM, we address these issues:

1. **We concur with the Commission's tentative conclusion to redesignate the wideband spectrum to broadband use consistent with a nationwide broadband strategy and to prohibit primary wideband operations on a going forward basis in favor of broadband use, but urge the Commission to not discourage local data inter-connected system development during the transition to a broadband national strategy on a secondary basis regardless of the achieved data rates, on the authority and under guidance of the national licensee and in concert with a national broadband implementation schedule.** We do feel, however, that on a secondary, transitional basis, wideband or broadband local spectrum usage in the public safety broadband block between 767.375-768 MHz should be an option to users on a case-by-case basis, as determined by the national licensee in consultation with regional planning committees during the transition. The MSHP also feels that wideband channels can be utilized on a secondary basis between 768-769 MHz in the "internal guard band" spectrum separating public safety broadband from public safety narrowband, but caution should be used by regional planners and the national licensee to ensure that such implementation does not introduce

interference into narrowband allocations between 769-775 MHz. We feel that the network operator and national licensee, as a device to promote concurrent development of inter-connected data networks in certain areas of the country, should develop and provide a long-term build-out schedule to regions identifying when broadband implementation will be completed in their community. Local agencies that will not be initially served by the national build-out schedule for an extended period of time should be permitted to develop, at the pleasure of the national licensee, their own local broadband or wideband data systems until the national broadband implementation is present in the region or the National Licensee feels that local use of the spectrum is impeding the progress of the National Broadband Strategy,

As an example of this, we feel that use of the public safety 50 KHz wideband data allocations and their recommended technologies have been surpassed for more efficient, cost effective technologies [1] as outlined by many commenters in these proceedings and public safety will benefit from those advances. We also feel that during the implementation of a long-term national broadband strategy, the National Licensee should encourage the public safety build-out of regional, multi-agency networks, regardless of the initial throughput such networks would deliver. Our reasons for this are considerable. We feel that public safety today lacks the network connectivity necessary nationwide to contribute substantially to a national broadband network and that the development of this inter-connection (network layer interoperability) between agencies at the regional level is paramount during any broadband transition. We also acknowledge that commercial infrastructure could contribute to serving a level of public safety

[1] Comments of Lucent Technologies, Inc. Docket 96-86 dated June 6 2006 Exhibit B "System Spectral Efficient Comparative Analysis". "...Provides a comparison of the spectrum efficiencies achieved by representative cdma2000 1x Evolution-Data Optimized Rev A ("EV-DO") and TIA-902.SAM ("SAM") Network Deployments and Exhibit E: Range Analysis of EV-DO-Rev. A and TIA-902.SAM."Our analysis suggests that for a comparable cell-edge data rate, the cell range achievable with EV-DO is greater than that of SAM."

network connectivity as such networks develop. We would urge the Commission to provide the national licensee the authority to require commercial providers requesting spectrum sharing to harden their infrastructure to a defined capability before having the privilege of entering into such arrangements to ensure that reliable public safety communications continues during natural or man-made disasters, inclement weather and instances where local power or facilities fail. These changes would be beneficial to public safety's future network capability and reliability, along with its anticipated future voice and data needs.

We also feel that within the NCC process, wideband 50 KHz channels and their aggregate were intended to operate in a manner in which agencies identified and applied independently to regional planning committees and the Commission for their own data needs, and the bandwidths identified to meet this purpose were relative to what was available in the 50 KHz public safety data allocation. The wideband data allocation was intended to serve agencies independently and it was assumed that the lack of any national public safety strategy would require each agency to individually license their own wideband data channels to meet their own internal data needs. We feel this anticipated use is also why a Physical (PHY) layer standard was developed and approved in the Telecommunications Industry Association (TIA-902). We feel public safety felt that the development of a PHY layer interoperability standard was required due to the lack of a national network, a national network strategy and any ability to achieve data interoperability at the Network layer of the OSI stack.

The MSHP now feels the public safety data environment has changed to one where more network-based, interoperable, regional wide-area networks are recommended for transporting

data services and the management of the existing spectrum should reflect new governance models identified without the need for physical layer commonalities to provide interoperability to end users. This new spectrum usage model is consistent with the Commission's desire today for a national broadband implementation strategy that includes a national licensee whose main responsibility is to provide guidance and oversight for steering a national public safety broadband strategy, implementation and continued development. We feel that aggregating wideband channels into broadband channel bandwidths, along with utilizing today's technologies that are more cost effective, can more aggressively re-use public safety spectrum and return higher data rates to the end user. In this case, a lesser number of wider bandwidth, high capacity channels being available within a community can introduce a greater degree of interoperability and regional interaction than a greater number of smaller channels can provide. As identified above using cost effective implementations and leveraging commercial technologies, this new solution is, for once, a winning combination for public safety both in cost savings and performance.

The MSHP feels strongly that during what will undoubtedly be a long national broadband strategy implementation, neither the Commission nor the National Licensee should discourage local broadband/wideband data system development as local infrastructure and backhaul capabilities developed could be contributable to an eventual national broadband strategy implemented within a community with wideband usage secondary to broadband usage. This is consistent with conclusions the MSHP provided the Commission in previous filings. The Commission should encourage the development of a nationwide public safety network prior to or concurrent with it seeking to implement a nationwide public safety broadband network. Any

locally developed inter-connected network, in its completed form and in developmental transition, will contribute to raising the interoperability quotient of voice and data public safety systems as inter-connected regional multi-agency public safety radio system needs grow during a national broadband transition. Local systems should be permitted under scrutiny of the national licensee and the national or regional network operator's published broadband strategy.

If determined that the development of local broadband or wideband systems at the regional level would contribute to the interconnected environment within that specific community, on a secondary, transitional basis, the system development should be permitted with caveats by the national licensee that make the local developer aware of the timeframe of the national broadband strategy build out, how it could change, and how any wideband implementation is secondary to the national broadband strategy. Should the national licensee determine that local wideband channel use impedes the development of the national broadband strategy in that particular community, the national licensee will terminate the local agencies privilege to utilize the spectrum and encourage migration to the tools utilized in the national broadband strategy. We also envision a series of broadband devices being developed during this broadband transition that include broadband capabilities with additional, "on-scene/off network" capabilities. These capabilities should be able to utilize IP addresses of devices and allow direct, off network, IP-to-IP transactions, including voice transactions if necessary between previously authenticated users during times of network outages and will be critical end user tools during times when on-scene communications must continue even though network access is not available. It is also possible that devices made available to public safety during this transition would have commonly deployed 700 MHz narrowband interoperability channels inherent in the devices to promote on-

scene, off network voice usage between first responders, as necessary. The ability for first responders to talk to each other, even when on the location of an incident, should always exist whether or not network capabilities are present or not.

When promoting dialogue with local and regional agencies regarding their data needs, the national licensee should utilize the local 700 MHz regional planning committee to retain a continuing dialogue with local agencies as to their technology choices and the time frame in which the national broadband strategy will be implemented within their community. We feel it is imperative that public safety agencies are not discouraged to build out independent data networks during the broadband transition but rather should be encouraged to eventually contribute in the long term to the growing inter-connected national public safety network in exchange for services on such a network.

**2. We support the potential for the 700 MHz public safety spectrum between 763-768 MHz to be utilized on both a regional and national basis while leveraging other commercial interests in public safety data development with oversight by a National Licensee and an inclusive process in which the Commission reconfigures the public safety 700 MHz narrowband allocation.** The Commission should consider establishing an inclusive process and a series of meetings intended to restructure the 700 MHz narrowband allocations between 769-775 MHz and ensure its viability and consistency with characteristics inherent to today's narrowband allocation. This process should be inclusive and open to public safety agencies from across the country to ensure all aspects of public safety's needs are met.

The narrowband portion of the public safety spectrum contains 6.25 KHz Low Power channels, General Use Channels, Interoperability Channels, Interoperability Calling Channels, Reserve Channels and Geographic State License Channels. Existing 700 MHz systems and subscriber units utilizing these channels will require funding to reprogram and we feel strongly that funds necessary to reprogram this equipment should not come from local agencies. Benefactors of the alteration of the public safety 700 MHz band plan should be required, by order of the Commission, to fund the reprogramming of this band at the local level. While the MSHP feels that band restructuring as outlined in this and other proceedings can allow for more cost effective use of public safety 700 MHz, assurances are required that the reprogramming of 700 MHz user to accommodate a new band plan should not be at the cost of the local licensee or agency.

Particularly difficult to identify as required for reprogramming will be 700/800 MHz subscriber units, which utilize 700 MHz interoperability channels without an agency based authorization. These channels are licensed by rule for mobile and portable use and administered in many areas by a State Interoperability Executive Committee (SIEC) or its equivalent, so local agencies across the country have freely programmed these channels into subscriber equipment and the exact extent of use cannot be determined via the Commission's Universal Licensing System (ULS) database. In addition, Geographic State License channels have also been implemented in many states and channels are not individually licensed by each user as their usage is under the State's Geographic license. As an example, the City of Independence, Missouri utilizes a seven channel trunked 700 MHz system under FCC Call-Sign WQEQ501, the first General Use licensed system in the Nation, and three of the seven channels utilized are State Geographic License Channels licensed to the State of Missouri.

We feel the Commission should take time to convene forums soon that allow for public safety input as to what new characteristics and structure best serve the new narrowband allocation between 769-775 MHz/799-805 MHz for use with both today and tomorrow's technologies. A Commission initiated inclusive public safety dialogue will lead to a narrowband allocation that will serve public safety in the future.

**3. We concur with the public safety 700 MHz allocations as represented in the Further NPRM's Proposal 3 and Proposal 4, which shift the public safety block down by 1 MHz, and aggregate all former wideband channels into a single 5 MHz broadband block while consolidating the two (2) public safety 3 MHz narrowband allocations into one six (6) MHz block separated by a one (1) MHz internal public safety managed guard band. The Commission and public safety should ensure that the 5 MHz block between 763 and 768 MHz is retained for future 5 MHz technologies and that public safety is not precluded from technological opportunities in the future, which utilize such bandwidths.** We feel that Proposal's 3 and 4, as documented in the Commission's Further NPRM, are in the best interest of public safety and makes for good public policy. These plans, an alternative to the Broadband Optimization Plan (BOP) originally submitted by Access Spectrum/Pegasus (3) and a similar version with a modified commercial allocation structure, both shift down the 700 MHz public safety band by 1 MHz addressing interference issues associated with Canada not allocating TV channels 64/69 to land mobile use and addresses subsequent relocation costs for existing 700 MHz licensees. While in previous filings the MSHP supported the BOP and the additional

spectrum it provided the public safety community, we feel either of these proposals offer the best alternatives to the BOP as they address international border concerns and funding the 700 MHz narrowband plan restructuring that consolidates two (2) 3 MHz narrowband channel blocks into one (1) 6 MHz narrowband channel block. The benefits to public safety are common from these two band plans.

The MSHP also feels that Commission designated regional planning committees can best manage the guard band spectrum separating public safety narrowband and broadband/wideband spectrum located at 768-769 MHz under the Commission's Proposal's 3/4 from the Further NPRM. The regional planning committees are best suited to address local concerns and know where in the band their current use is and can through local control best manage the channel usage. Regional planning committees are best informed as to the use of the band within their specific region and the impact on any adjacent region use. Some entities feel that wideband use should be permitted in this portion of the band, but we feel that such wideband use should be secondary and is a matter best left to the regions to manage as they would be aware of any immediately adjacent narrowband use and how wideband use in this Guard Band, even on a secondary basis, could cause interference to certain narrowband mission critical voice operations. The MSHP feels that that block of spectrum from 768.375 thru 769 MHz is the best location for secondary, transitional wideband data to be implemented on during the national broadband strategy with the least possibility of interference resulting in either the national broadband block or the public safety narrowband allocation.

4. **We concur with a National Licensee being allocated primary status on a nationwide license for the broadband spectrum block between 763-768 MHz to oversee the national broadband implementation strategy. The MSHP feels that the National Licensee should consist of national, state and local public safety users and representatives, including representatives of APCO, International Association of Chief's of Police (IACP), International Association of Fire Chiefs (IAFC), the Commission's designated regional planning committees (RPC'S) as well as other advocacy organizations such as National Association of Regional Planning Committees (NARPC), National Public Safety Telecommunications Council (NPSTC), National Association of State Chief Information Officers (NASCIO) and the National Governors Association (NGA). We also feel that the 1 MHz paired block between 768-769, which separates public safety's broadband and narrowband allocations, should be managed locally within regions by the appropriate regional planning committee with input from local licensees, respective adjacent region regional planning committees and the national licensee.**

We feel strongly that in the implementation of the Nationwide Public Safety Broadband Strategy, the National Licensee's main responsibility should be to provide direction, support and guidance to the nations public safety agencies during what will be a long-term paradigm shift in spectrum usage, system implementation and leveraging exciting new technologies and commercial markets resulting in public safety end user being better prepared to serve their constituents. To this end, any distribution of local licenses by the Commission in the broadband public safety block band will detract from any progress resulting from a national strategy and revert public

safety back to an environment in which an agency's desire to seek their own independent FCC authorization and restating an agency's individuality may contribute to the creation of less interoperability within individual communities. We are convinced there are regulatory mechanisms that can allow agencies a similar degree of choices while also offering more, not less, cost effective methods to meet their ongoing communications needs.

It is possible that by simply requiring agencies to adhere to the Commission's rules absent an over-arching implementation strategy, previous regulatory environments allowed individual agencies too many choices to promote interoperable networks and independent entity based authorizations provided entities with the ability to indirectly create a non-interoperable environment within their communities. In fairness, agencies that were paying total costs for their communications systems had no option but to independently license their system to ensure funding availability. Only a new regulatory method and architecture created by the Commission which promotes standardized, non-proprietary cost-effective market based regional public safety systems development and proves to be able to provide sufficient service efficiently to multiple agencies will satisfy an agencies need to not hold an individual license for their communications capabilities. Agencies have to be certain they will be included in the national collective and confident of their representation in the process before they are willing to have a national licensee be granted the authority for spectrum management in their community and meet their communications needs.

To some degree, the manufacturers and vendors who interface with agencies today contribute to the development of disparate, incompatible systems by offering agencies proprietary solutions to

meet their individual agency needs in both common and disparate public safety radio bands. Without a national interoperability communications strategy available to agencies at the local level, achieving communications interoperability between agencies in a community was often ignored in favor of agency based solutions that may or may not consider sufficient interoperability between agencies within a given area a priority. With multiple bands, independent agency based funding opportunities and multiple layers of government all working to identify what is best for a specific agency, it should be no surprise that agencies seek to meet their own agencies needs first before trying to solve or contribute to regional interoperability causes. While not necessarily saying that having less choice in agency based system design implementation is preferred, we feel that today, agencies should implement choices more focused to strategies operating under a established national architecture while leveraging regional interaction between entities. Any new regulatory process in the upper 700 MHz band addressing broadband public safety data should provide agency's information on a national strategy with which to work in and Best Practices that should be promoted in which agencies can meet, convey and achieve their specific needs. Since local control of systems can do as much harm as good to promoting interoperability within a community, a better solution is required. The current environment has proven, over time, that a new methodology is required to promote the global issues important to public safety and to allow them to move forward is a manner that is based on user needs, not manufacturer's needs. In exchange for a lessening of data system control and ownership at the local level, end user based analysis should find that better capabilities achieved with lower costs is in the interest of the public and the interest of those in the first responder community.

The Commission should require and establish performance requirements for network layer data interoperability, build-out, and sharing mechanisms utilizing preemptibility of commercial access on public safety spectrum as well as system robustness, hardening of system backhaul and contingency plans for public safety spectrum retrieval within commercial infrastructure, should established sharing mechanisms cease benefiting public safety. Sharing arrangements between public safety and commercial licensees should be living documents that are reviewed annually by the licensee, the network operator and the Commission for the continued benefit of all parties involved. Changes in the communications landscape within a community may allow for improved performance, a wider area of coverage, improved spectrum utilization and other benefits to all entities engaged in the sharing agreement and periodic review of such agreements can be beneficial. However, any cooperative spectrum sharing between public safety and commercial wireless users must include language that allows such sharing to cease should the local agency and/or national licensee determine that the arrangement is no longer beneficial to the public safety community it is intended to serve.

If the Commission feels strongly that a national public safety broadband strategy is necessary, there should be confidence in the National Licensee's representation of the entire public safety community and not solely consisting of select representatives from national public safety associations. The National Licensee should consist of representatives of national associations, State and Local public safety users, members from Commission designated regional planning committees and other experts in the industry along with a non-voting contingent from the network operator(s) and communications manufacturing community to ensure that the decision making process of the National Licensee best represents public safety users in the field

realistically in coordination with available technologies. In addition, a National Licensee should have a rotating governance mechanism that ensures equal participation from all over time, with representation from all states and territories being critical to the overall benefit.

Being consistent with previous MSHP comments in this proceeding in response to the Ninth NPRM, the MSHP feels that the necessary qualities required in a national licensee and the requirements that the Commission previously outlined for this role currently exists under the Association of Public Safety Communications Officials, Inc (APCO) and their non-profit Automated Frequency Coordination (AFC) subsidiary, one of the four (4) Commission Certified Frequency Coordinators. We urge the Commission to consider APCO as a National Licensee candidate.

The MSHP, with its history of supporting public safety spectrum management in Missouri, sees the Commission's NPRM as an opportunity to provide public safety with direction and a long-term strategy in its future 700 MHz implementations under a national licensee. By creating a national licensee to serve as an enabling entity, the Commission can ensure that public safety will have the opportunity to seek guidance, build toward a collective goal that will better serve the nation and maximize available opportunities whether those opportunities be partnerships with wireless carriers, public safety based regional broadband initiatives or simply exploring the sharing of resources with other public safety entities in order to meet the capabilities necessary to effect sufficient communications within their community. For too long, public safety agencies have been required only to operate within the Commission's rules, often without the benefit or complete knowledge as to what implications their actions had on their degree of interoperability

within their community. We hope the Commission seeking a new public safety regulatory environment for the 700 MHz public safety allocations provides dividends to public safety in its effectiveness, improved efficiencies, cost savings and use of improved technologies that leverage commercial markets, when applicable.

With the implementation of some of the concepts recommend by the Commission, public safety entities can enter into decisions regarding its future communications capabilities more informed than before, which could accomplish several tasks: A new shared environment could increase opportunities for public safety in maximizing use of funding for critical areas of system coverage and costs and with more information available to decision makers, could increase the interoperable quotient between neighboring agencies, allowing neighboring jurisdictions to jointly develop common parameters in their system design with spectrum usage oversight by the national licensee. It could also beneficially share communications infrastructure with public and private wireless users. Such collaboration could introduce the concept of cost savings in public safety network development by the proliferation of commercial off the shelf (COTS) voice and data devices in the public safety mission. COST based public safety subscriber units will provide users shorter life cycles, accelerated technology refresh and the benefit of an increased feature set in their devices.

As an agency seeking solutions to communications challenges on a day-day basis in the midst of rapidly changing technologies, the MSHP realizes that private entities and manufacturers often promote a degree of disparity between public safety users within a community with proprietary technologies and implementations in mind to meet other ends. This disparity can sometimes

lead to a lack of interoperability in a region. At times, it is in the best interest of a private entity, but not the public safety entity, for a solution to be introduced in an area that differs from adjacent existing implemented technologies from competing interests. The Commission cannot rely on private entities to foster and determine interoperability at the local level. This must be part of a larger, long-term strategy by the national licensee and decision-making at the local level must be made vetted and available at the regional and national level to ensure the local implementation is consistent with the long-term strategy.

The MSHP recognizes that while business models and competing manufacturing private interests may find it necessary to occasionally introduce solutions within a community that can result in a greater degree of operability than interoperability with surrounding agencies, we feel it should be the responsibility of the national licensee to ultimately discern as to the best use of the spectrum at the local level. In the end, individual public safety agencies within communities can be better served operating under a National Licensee providing spectrum management and implementation guidance at the regional and local level.

The National Licensee can provide a national perspective and work to minimize the impact resulting in less interoperability that can be caused by competing interests within a multi-agency community. A national licensee can utilize its national license to promote and prioritize the concept of regional seamless functionality in a public safety community; a role that is lacking in today's fractured public safety community. The MSHP feels the role of such a national licensee role is necessary to steer the process and that a regular dialogue should take place between the

national licensee and public safety community representatives to ensure that agency representation continues within the scope of the Commission's national broadband strategy.

Lastly, communications technology is rapidly changing. Public safety wireless needs, due to their share of the marketplace and their more stringent requirements when compared to commercial providers, have lagged behind commercial wireless technological advancement by several years. Proposal's 3 and 4 from the Commission's Further NPRM position public safety's wideband data spectrum favorably, lending it to greater sharing opportunities between public safety and commercial wireless providers. These band plans are also beneficial as they provide that future 5 MHz technologies are not precluded from use in the band. The lack of a 5 MHz block in the public safety allocation could impair future public safety advancements and, with today's rapid changes in technology offering new solutions every day, future capability should be considered to ensure that 5 MHz technologies are available. Before the 700 MHz band becomes more developed by the public safety community, the MSHP requests the Commission review this proposal in a timely manner and provide guidance to the public safety community with regard to the structure of the 700 MHz band plan and its future broadband capabilities. In addition, a new public safety band plan with narrowband and broadband capabilities may offer manufacturers additional opportunities to further review the plan and re-define existing narrowband equipment parameters to capitalize on technologies and channel placement anticipated in the new band plan.[2]

[2] For example, the current 700 MHz band plan requires narrowband subscriber units to operate down to 764 MHz to access narrowband channels in the 3+6+3 public safety 700 MHz narrowband structure. In future band plans with the narrowband channel blocks consolidated on the top of the band, equipment operating in the narrowband allocation may only need to go as low as 769 MHz. Reduced interference to narrowband operations may be the byproduct of such foresight as redesigning the bandwidth of narrowband subscriber units could minimize a degree of energy from the lower broadband channels into narrowband subscriber units. Proactive design based on a solidified band plan would contribute to a better narrowband operating environment for users.

5. **Wideband technologies should be permitted on a secondary basis utilized in a transitional manner during the implementation of the national broadband strategy. Secondary use of 700 MHz data implementations should be implemented at the pleasure of the national licensee and a regular dialogue between secondary users, regional planning committees and the national licensee will ensure a smooth transition from today's stovepipe, agency-based data systems to a national public safety broadband network. (See Appendix A)** If left to their own financing, many areas in rural Missouri that have no network connectivity or any viable commercial wireless coverage today will not be capable in the near term of independently building a data public safety network within their community. This will lead to areas within the State being isolated from other Missouri communities who may have developed broadband capabilities. To this end, we feel the Commission needs to allow public safety agencies the ability to determine if they will receive broadband capabilities in their community in the time frame negotiated between public safety, regional planning committees, the National Licensee and commercial wireless licensees, while also allowing Missouri public safety communities the ability to develop the connectivity and data capabilities they think best fit their needs.

We feel that if the time frames initially agreed to for public safety broadband potential within a Missouri community are not met, the community, with discussion and oversight provided by Region 24 700 MHz Regional Planning Committee and the National Licensee, should be permitted by the Commission's rules to utilize the public safety data allocation in the manner they feel best suits them, regardless of the system throughput, while promoting increased

network connectivity in the region, at the pleasure of the national licensee. While the solution for that particular community may not be a broadband one, the connectivity utilized by the community for its data product should be capable of interfacing and contributing with the national public safety network to ensure a minimal degree of interoperability with surrounding areas.

To accommodate situations in which public safety agencies have to identify and build data systems that best fit their needs during the public safety broadband transition and after users within a community have been notified that broadband implementation associated with the National Broadband Strategy will not be imminent, a portion of the spectrum from 767.375 MHz to 768 MHz can be utilized for local secondary, transitional wideband data implementation until the national broadband strategy is developed in the area. Local broadband use of spectrum within the 763-766.75 MHz band is at the pleasure of the national licensee and should be implemented in coordination with the network operator(s) broadband build-out schedule. Local broadband system development ahead of the national strategy should be encouraged and managed by the national licensee using channels from the 3.75 MHz national broadband allocation. While declaring the intent for a National Broadband Strategy is an important benchmark for the Commission, local use of the public safety broadband block on a secondary basis should still be permitted in areas where needs are identified to be at bandwidths using less than broadband data rates to encourage data system network development and backhaul. Network maturity will allow for an easier broadband transition and will provide a more interoperable environment for future voice and data public safety systems.

While some commercial backhaul or connectivity exists in certain areas of the country, many areas of the country where public safety has needs would benefit from the development of an interconnected public safety network. The network will provide significant long-term benefit to public safety's broadband data capabilities, along with raising its voice interoperability quotient in those areas. It is important to note that with the proper network development and implementation, broadband, wideband or narrowband data systems can be interoperable with any other broadband data systems at the Network (Routing) Layer[3] of the Open System Interconnection (OSI) Seven layer Networking model with sufficient connectivity between such systems.

Ironically, the slow pace of the DTV transition has provided the public safety community an extraordinary opportunity to revisit to its initial band plan as developed by the National Coordination Committee and adjust it to leverage new technologies identified since 2001 and subsequent advancements in public safety applications. We urge the Commission to adopt the Alternative Plan to best prepare public safety and any subsequent national licensee for the next generation of public safety communications capabilities and applications.

6. **We support the concept of a national network operator as outlined in the Frontline proposal that works with the national licensee in order to facilitate a public safety**

[3] Network layer of (OSI) Open Systems Interconnection Seven-Layer Networking Model is identified as Layer 3, which is responsible for routing tasks in network architecture. With the efficient use of Internet Protocol (IP) in today's communications technologies, data systems of varying bandwidths can be interfaced at the Network Layer and will allow sharing of data as long as a sufficient degree of connectivity is maintained between the systems of disparate bandwidths. Granted, some high bandwidth applications may not be operate probably on narrowband/wideband data systems, connectivity being established at the Network Layer can provide some text and other lower-bandwidth applications between agencies utilizing disparate physical layer technology that can be beneficial during times of emergency and recovery, etc.

**broadband strategy. We have questions as to how public safety is ensured of being able to promote its priorities in such an arrangement or arrangements with private companies, without being in the position to regulate those companies. We seek additional dialogue with the public safety community, the national licensee and other commercial wireless licensees to provide clarification as to how such an arrangement might work towards both the benefit of network operator(s) and public safety.** The MSHP fully expects proposals, such as the Frontline proposal, implemented cooperatively and allow public safety broadband implementation to leverage commercial holdings and infrastructure to initially provide a degree increase in public safety broadband potential. We remain concerned, however, that rural areas of Missouri and other parts of the country, historically deemed less attractive to cellular build-out by wireless carriers due to the lack of an effective cost recovery mechanism or Return on Investment (ROI), will not be developed within the time frame necessary to effect public safety nationwide broadband capabilities. Given this conclusion, we urge the Commission to provide rules that will allow public safety agencies the ability to use the appropriate spectrum, as outlined in these comments, to build agency/regional based data systems intended to meet an agency's own needs if the broadband implementation dates for the national broadband strategy agreed upon by the network operator, the national licensee, public safety and the regional planning committees are not met. Again, we urge the Commission to ensure that a continued dialogue along with flexible, interim management of the spectrum between 763-768 MHz within the Proposal 3 or Proposal 4 Band Plan by the national licensee, the regional planning committees, network operators and the user community moves forward as communications between entities governing the national strategy and the users will provide fewer surprises and better public safety capabilities at the local level.

The Commission, through its rules, should ensure that public safety agencies that are not served by a national licensee/E block licensee network are able to access the spectrum previously available exclusively to them to meet their own data needs and encouraged to build out infrastructure that would be contributable to the national public safety broadband strategy. In this proceeding, we feel it is imperative the Commission place a strong emphasis on promoting an increase in the degree of connectivity between public safety agencies within regions. It is this lack of connectivity[4] that often leads to disparate, stand-alone radio systems not able to interface with each other or achieve interoperability locally for voice or data needs. The result, combined with the political realities that exist in every community, have created fragmented communications capabilities within a public safety community that has identified little to no benefit in regional, cooperative development of voice and data systems. What is lacking in this sense is an overall strategy that implementations must acknowledge and meet. The MSHP hopes that this proceeding can begin to bring a solution to local public safety communities as shown by the improvement of both operability and interoperability in multiple agency environments while also making regional broadband capabilities and applications available through commercial technologies to agencies not able to develop such capabilities on their own.

To best utilize this new regulatory environment, a migration period should be established within the national broadband strategy with a focus and priority on the analysis and development of

[4] It is estimated that at least 2/3 of the public safety systems currently implemented in the US do not utilize any network connectivity or backhaul (high or low bandwidth) between dispatch/control facilities and remote transmitter sites. The bandwidth achieved by users at the "last mile" of the public safety communications environment should initially be of secondary concern to the Commission with the priority in such areas to be promoting the development of inter-connected radio systems to further interoperability nationally. High bandwidths cannot be achieved at the last mile without connectivity of sufficient capacity between the mobile receive site and the core network.

current and future public safety networks. In many instances, public safety entities could build-out data systems while acknowledging existing commercial networks in operation and avoid duplicative coverage efforts over a specific area. In addition, public safety's introduction of broadband capabilities and network connectivity in more sparsely populated areas that previously did not contain commercial coverage can benefit and increase the build-out of commercial wireless carriers and extend their coverage footprint without shouldering all of the cost for the entire development. This migration period should be overseen by the National Licensee who will acknowledge and identify existing commercial capabilities, evaluate whether or not they can or will meet established public safety resiliency requirements, and coordinate new public safety connectivity projects to adhere to the Commissions long term public safety broadband strategy while operating cooperatively, where beneficial, with existing commercial and non-commercial networks. This development should be concurrent with the identification of public safety redundancy efforts addressing the hardening of existing commercial network backhaul and resiliency, where necessary.

The Commission should place a priority on the development of a national public safety network. Guidelines need to be established as to how a national public safety network accommodates and effectively migrates pre-broadband technologies toward broadband solutions, rather than initially identifying the need for a nationwide broadband public safety network and failing to acknowledge the need for the increased connectivity necessary to realize such a network. The MSHP feels that to go from where we are today, with little public safety network connectivity in operation to speak of across the nation, the Commission envisioning and working towards a nationwide public safety broadband network in one step is premature without acknowledging the

creation of such a network will not take place without first developing a national public safety network. This will take a number of years and a tremendous amount of network development to become a reality, from commercial, private and public safety sources. Public safety agencies should focus, under the guidance and management of a National Licensee, on cooperatively developing contributable backhaul networks for 700 MHz public safety data (with sufficient bandwidth) that can work in conjunction with existing and future commercial wireless infrastructure to ensure nationwide public safety coverage is achieved during an incremental process, over a period of years.

The National Licensee should have final determination over new wideband implementation and be in constant with the network operator and regional planning committees to assess the local 700 MHz environments. They should provide applicant's guidelines as to national public safety migration timeframes, how connectivity developed for agency specific or regional wideband data solutions can be an asset identified within the national public safety broadband strategy and that the applicant must conform to accessing broadband capabilities, in accordance with the long-term broadband public safety strategy. The national licensee should make the applicant aware that their use of wideband is at the discretion of the national licensee and provide appropriate guidelines and conditions for wideband implementation which can include identification of national broadband public safety developments in other nearby regions and when such broadband development is anticipated in communities adjacent to the wideband data request. Agencies requesting wideband capabilities should be required to agree, in writing, to Memoranda of Agreement with the National Licensee ensuring they area aware that the life cycle of their

wideband equipment and its usage could be cut short due to the National Broadband Strategy being implemented in their area.

A facility contributing to public safety and the redundancy of the network it supports are important to public safety. The network operator should develop a network that meets established public safety reliability requirements. They are: 24 hour backup power capabilities in cases where commercial power is lost, network design redundancy and established repair personnel response times to each location during outages, among others. Any network serving public safety must be developed to the level that it provides a degree of resiliency as defined by public safety, the national licensee, the network operator and the Commission and a list of Best Practices should be distributed to all public safety agencies promoting the local development of hardened facilities and network characteristics.

The network operator should be able to initially offer public safety wireless data service in the development of the national public safety broadband strategy at less than broadband speeds on a transitional basis. Edge of cell data speeds should be permitted and developed by the national operator during the broadband transition. In addition, these decisions may also be measured upon how many resources are available to the National Licensee and the E Block Licensee in a given area. Deployment can be less expensive in areas where existing assets can be utilized in an evolving broadband network. The development of a schedule for cooperative broadband implementation should take into consideration all of the factors listed above. The national licensee should be able to provide the applicant information from nearby 700 MHz commercial licensee's highlighting spectrum sharing possibilities, discounts on subscriber fees when public

safety spectrum can be utilized by E Block licensee in their continued broadband nationwide deployment, and anticipated subscriber fees rates in their areas. Information can also be provided to the applicant how rates of access within the national broadband implementation can be reduced in exchange for agency owned infrastructure and hardware being contributed to the national build-out. Maintenance and access will be just a few of the necessary agreements that will have to be entered into by the national operator, the national licensee and the applicant to ensure the viability of an eventual nationwide public safety broadband network. Again, the Commission should ensure that participants in the long-term public safety broadband goal do not, while striving to develop a Nationwide Broadband Public Safety Network, impede the development of a baseline Nationwide Public Safety Network, characteristics of which will be a required baseline element in the public safety end product.

The Commissions rules should outline the process in which an adjacent block auction winner that, as a condition of the license commits to public safety build-out and requirements, with consideration of the National Licensee and Regional Planning Committees, schedules the build-out of the nationwide public safety broadband network. While the network construction and build out must be at no direct cost to public safety, the timeliness of the build-out should coincide with public safety's needs in various regions of the country. In addition, the development of the system in one area of the country should be determined by multiple considerations with public safety's ability to utilize existing broadband capabilities and infrastructure being paramount in that decision making process. The national licensee, in cooperation with regional planning committees, should develop a schedule that is to be adhered to with regard to locations for 700 MHz auction winner broadband developments. This schedule

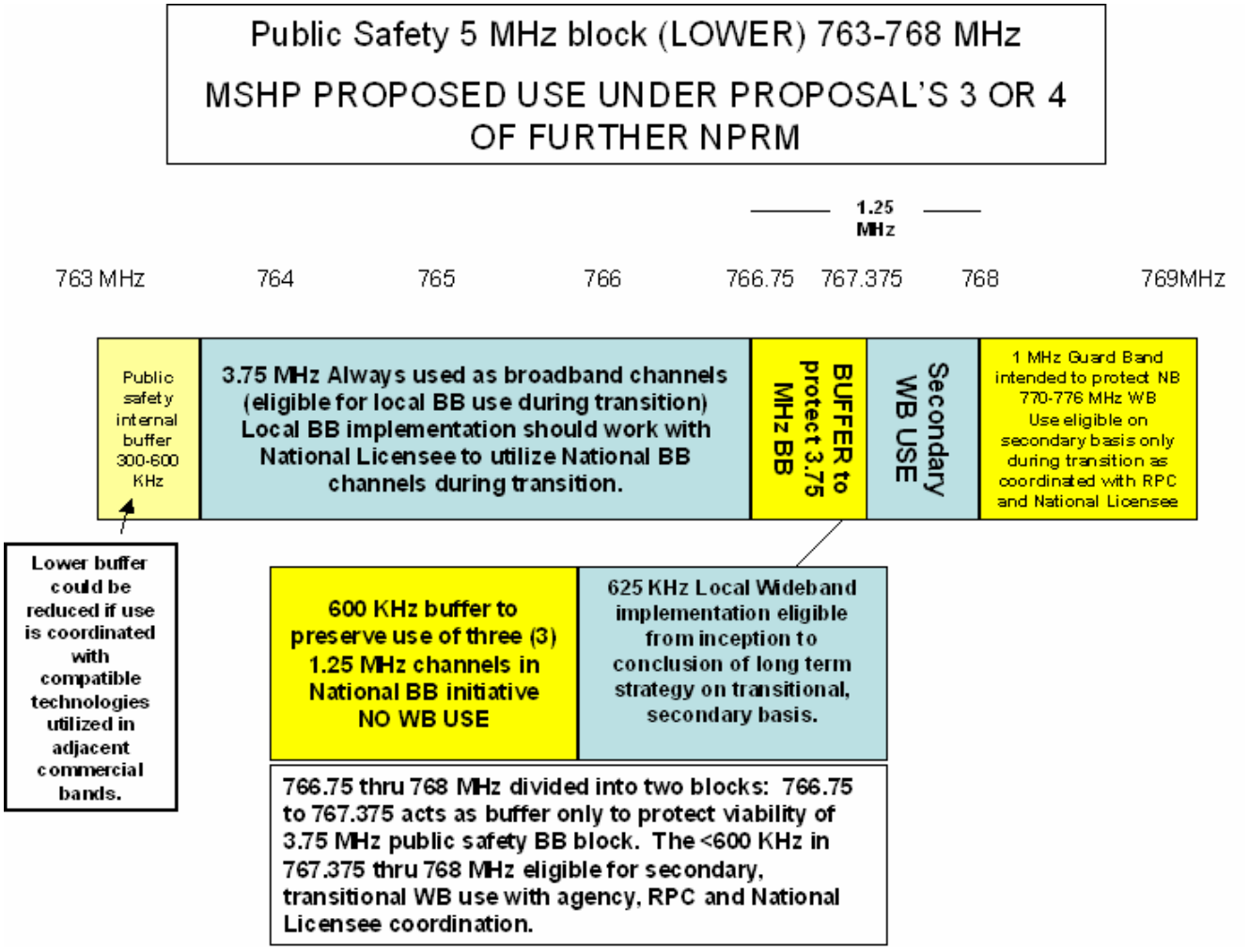
should balance public safety's need within regions and the 700 MHz auction winner's commercially viable needs to offer spectrum capacity to its user base. While some public safety agencies might be prepared to utilize the national network earlier, regional planning committees can provide the perspective for broadband needs at the user level within each region to ensure that build-out most quickly meets the needs of those that initially need it the most.

We thank the Commission for the opportunity to comment on this most important issue. We look forward to providing additional comments in the future.

Sincerely,

JAMES C BIGGERSTAFF, Director of Radio
Missouri State Highway Patrol Communications Division

# Appendix A


Public Safety 5 MHz block (LOWER) 763-768 MHz
MSHP PROPOSED USE UNDER PROPOSAL'S 3 OR 4 OF FURTHER NPRM
1.25 MHz
763 MHz
764
765
766
766.75
767.375
768
769MHz
Public safety internal buffer 300-600 KHz
3.75 MHz Always used as broadband channels (eligible for local BB use during transition) Local BB implementation should work with National Licensee to utilize National BB channels during transition.
BUFFER to protect 3.75 MHz BB
Secondary WB USE
1 MHz Guard Band intended to protect NB 770-776 MHz WB Use eligible on secondary basis only during transition as coordinated with RPC and National Licensee
Lower buffer could be reduced if use is coordinated with compatible technologies utilized in adjacent commercial bands.
600 KHz buffer to preserve use of three (3) 1.25 MHz channels in National BB initiative NO WB USE
625 KHz Local Wideband implementation eligible from inception to conclusion of long term strategy on transitional, secondary basis.
766.75 thru 768 MHz divided into two blocks: 766.75 to 767.375 acts as buffer only to protect viability of 3.75 MHz public safety BB block. The <600 KHz in 767.375 thru 768 MHz eligible for secondary, transitional WB use with agency, RPC and National Licensee coordination.